Use of a data warehouse to monitor Simvastatin Tablet Splitting

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Abstract: A data warehouse was used to examine the LDL levels for patients who were switched from whole to half tablets of simvastatin. The LDL levels were available both pre and post conversion. 7,321 patients were switched and the LDL levels for these patients were tracked. 1,408 patients had a slight increase in LDL (less than 15% above baseline). Those patients whose LDL increased by greater than 15%, and was above 120 mg/dl, were switched back to whole tablets.

Recent articles in professional journals and the lay press have raised issues about the safety and efficacy of splitting tablets as a cost saving method for patients to economize on their prescription drugs.[1,2,3] Most drug companies include development, marketing and other costs in their pricing formula. As a result, the cost differential between various strengths of the same drug is often low or non-existent. Splitting a 40 mg simvastatin tablet to get two 20 mg doses can save a patient $30 per month in drug costs.

This is predicated on the assumption that using split tablets provides the same therapeutic benefits as the whole tablet. In order to validate this assumption we developed a model for assessing the efficacy of tablet splitting. Other studies have examined the effectiveness of splitting, but these were based on attempts at determining compliance, based on tablet counting, and were not based on subjective data such as laboratory values.[4]

Our facility determined that it could save 1.5 million dollars per year by splitting simvastatin. Patients were provided tablet splitters and were given detailed instructions by a pharmacist with their first prescription for the split dose. Patients were advised to split only one tablet at a time and take the doses on consecutive days. Newer patients are started directly on split tablets and since they were being titrated to therapeutic goal and had never been on whole tablets it was decided to follow only those patients who were switched from the whole to half tablets.

Using our facility's data warehouse we extracted all of the prescription data for patients taking simvastatin. This data was then further analyzed using the quantity of medication dispensed (qty) and the days supply (ds) of medication to automate the determination of whether or not a tablet was split. The assumption was that a ratio of qty/ds of .5 would indicate that the tablet was being split.

One could argue that this could also imply that the patient was taking the medication every other day. Since the data warehouse also traps the detailed instructions, we examined the validity of the data in a random sample of 100 records. Every record where the ratio was .5 had a detailed instruction to the effect of "Take one half tablet daily". The complete instruction set was not used for the study because there were variations of one half (one-half), ½ , one half, 20 mg etc, that would make it more difficult to analyze. We then used the data to calculate the daily dose of the drug, to verify that the dose had not been changed for at least three months after conversion to the split dosage form.

All the foregoing was done using a database management tool (MS Access) on two abstracts from the data warehouse; all patients on simvastatin and all LDL levels for those patients. This amounted to 116,802 prescription records for 7,321 patients who were switched. Currently there are 42,257 patient taking simvastatin and 85% of these patients are on split tablet doses. The vast majority of patients are now started on the split dose.

The laboratory data included 53,793 LDL values for these patients. The entire analysis took less than one day to complete! The results indicated that 1,408 patients had slight elevations (less than 15% from baseline). Those patients who had levels that increased after the split and whose LDL was greater than 120 mg/dl were placed back on whole tablets.

We applied this model to simvastatin but it would work equally as well for any agents which have objective outcomes data. This methodology also demonstrates the utility of data warehouses in the health care environment.

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[1] McCarthy R; Desperate Remedies? Pill-Splitting to Shave Pharmacy Costs; Drug Benefit Trends 1999; 11(12): 19,21

[2] USA today; Paqtients who try to cut pills often miss; USA Today 1999; 05/20/99, pg 03 B

[3] McDevitt JT, Gurst AH, Chen YOI; Accuracy of tablet splitting, Pharmacotherapy 1998; 18:193-7

[4] Fawell NG, Cookson TL, Scranton SS; Relationship between tablet splitting and compliance, drug acquisition cost, and patient acceptance; Am J Health Syst Pharm 1999; 56:2542-5